Transport Canada Transports Canada

TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 477 or 480 of the Canada Shipping Act (1985)

Rapport d'investigation au Ministre conformément aux articles 477 ou 480 de la Loi sur la marine marchande du Canada (1985)

Canada

91-05127/

Ce rapport est aussi disponible en français

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE GROUNDING OF THE CANADIAN TANKER "J.C. PHILLIPS" IN THE BEAUHARNOIS CANAL ON NOVEMBER 24, 1989.

REPORT No. 549

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE GROUNDING OF THE CANADIAN TANKER "J.C. PHILLIPS" IN THE BEAUHARNOIS CANAL ON NOVEMBER 24, 1989

Particulars of the vessel

Name	"J.C. PHILLIPS" ex "GULF GATINEAU"
Official No.	370929
Port of registry	Montreal
Flag	Canadian
Call sign	VOLP
Gross tonnage	5,924 tons
Net tonnage	4,176 tons
Registered length	122.0 m
Breadth	18.3 m
Moulded depth	8.56 m
Draught (at time of collision)	Forward: 6.83 m Aft: 6.86 m
Type	Tanker
Built	Steel, built at Sorel in 1976
Propulsion	One 5,000 bhp diesel engine driving a single controllable pitch propeller
Speed	13.5 knots
Bow thruster	One
Cargo	8,159 tons of calcium chloride
Crew	21 persons
Owners	Socanav Inc., Montreal

Navigating equipment

Radar 1	Anritsu
Radar 2	Anritsu
Echo sounder	Elac

Direction finder	Lodestar
Loran C	Raynav 750 MK II
VHF 1	SRA - ME 60
VHF 2	SRA - ME 61
SSB	Marconi ch 150
Gyro compass 1	Sperry SR-120
Gyro compass 2	Sperry MK-37
Magnetic compass	One
Course recorder	Sperry

NOTE: All times in this report are expressed in Eastern Standard Time (UTC minus five hours), unless otherwise indicated.

Description of tanker

The "J.C. PHILLIPS" is a classic single-shell tanker with 15 cargo tanks located ahead of the engine-room. The accommodation and navigation bridge are located at the stern and above the engine-room.

Background

The tanker "J.C. PHILLIPS", downbound in the Beauharnois Canal, grounded at approximately 0640 on November 24, 1989. The casualty occurred within the port limits of Valleyfield. Visibility was near zero, and the temperature was -10° C.

At the time of the casualty, there was no blind pilotage regime in place in the wheel-house and, in addition, the person having the conduct of the vessel was distracted by a radio communication from the upbound vessel "RALPH MISENER". During this radio communication, the "J.C. PHILLIPS" had initiated her turn to port to head in an easterly direction. Since the vessel's position in the channel was not verified by radar, the vessel left the channel and came to a stop south of Buoy C31.

The cargo carried by the "J.C. PHILLIPS" was liquid calcium chloride, some of which leaked from No. 1 port tank after she was holed on impact.

During attempts to refloat the vessel, the steering gear was heavily damaged due to the vessel being taken astern, on to another shallow area. The "J.C. PHILLIPS" was then towed to Les Méchins dockyard after unloading her cargo of calcium chloride at Montreal. The cost of repairs was summarily estimated at $1 million.

Narrative

During the day of November 20, 1989, the Canadian tanker "J.C. PHILLIPS" departed Amherstburg, Ontario for Halifax, N.S. with a cargo of some 8,159 tonnes of liquid calcium chloride. Early on the morning of November 24, 1989, the tanker passed through the Snell and Eisenhower Locks.

The weather was clear and the wind variable. Barometric pressure was steady at 1,009 mb, and the air temperature was 10° C. The trip was progressing normally, without incident.

At approximately 0618, the "J.C. PHILLIPS" was abeam of floats D1 and D2, upstream of the entrance to the Beauharnois Canal. A zone of reduced visibility owing to sea smoke was noted from the wheel-house. At about 0619, at calling-in-point No. 5, the "J.C. PHILLIPS" reported her position to the Marine Traffic Control Centre and Seaway Beauharnois informed her that visibility was down to approximately 0.25 mile above the St. Louis Bridge and also advised her of the presence of an upbound vessel, the "RALPH MISENER", downstream of the bridge.

At calling-in-point No. 5, the master was advised of the vessel's approach to the Valleyfield Bridge. At approximately 0623, the "J.C. PHILLIPS" made a navigation safety call on VHF R/T channel 14 to report her position as being two miles above the bridge. In the wheel-house were the master, the officer-in-charge of pilotage, the officer of the watch and a helmsman. The port and starboard radars were in operation, and the echo sounder was off.

The speed of the "J.C. PHILLIPS" was reduced to 'slow speed ahead' awaiting the green light at the Valleyfield Bridge and, when the bridge was raised, the speed was increased to 'half speed ahead'. At about 0632, the "J.C. PHILLIPS" was under the Valleyfield Bridge, and the master returned to his cabin for a brief period. Visibility continued to deteriorate, eventually becoming near-zero in the vicinity of the Valleyfield Wharf. The master returned to the bridge.

At approximately 0638, Seaway Beauharnois called the "J.C. PHILLIPS" to inform her that the upbound vessel "RALPH MISENER" was upstream of the St. Louis Bridge. The vessel was also advised to ensure that contact with the "RALPH MISENER" was established and meeting procedures arranged. This radio communication between the "J.C. PHILLIPS" and Seaway Beauharnois lasted some 30 seconds.

The officer of the watch was on the starboard side of the wheel-house attempting to locate the buoys visually through the sea smoke. The master was standing on the port side of the wheel-

house, and the officer-in-charge of pilotage was handling radio communications and radar navigation, on his own.

At about 0639, some 13 seconds after the call between Seaway Beauharnois and the "J.C. PHILLIPS", there was another radio call on channel 14, wherein appropriate radiotelephone calling procedures were not used; the calling station asked, "Is that you, Claude?", and the called station replied, "Yes, it's me."

In fact, the calling station was the upbound vessel "RALPH MISENER", and the called station was the "J.C. PHILLIPS". At the time of this call, the officer-in-charge of pilotage had already initiated his turn to port and had left the radar unmonitored in order to answer the radio call from the "RALPH MISENER". During this time, the "J.C. PHILLIPS" was turning slowly to port, and no one in the wheel-house checked on the radar the vessel's lateral position in the channel. The radio communication which lasted for some 40 seconds was limited to the conditions of visibility and that each vessel will keep to her side of the channel, whilst passing.

At the end of this radio communication with the "RALPH MISENER", the officer-in-charge of pilotage returned to the radar and realized that the "J.C. PHILLIPS" was to the south of the channel. He ordered the helmsman 'to turn more quickly to port'. The master asked his officer what was happening, and at the same time the "J.C. PHILLIPS" touched bottom and, after several bumps, came to a stop south of Buoy C31 on a heading of 080° (G). The time was 0640, and the "J.C. PHILLIPS" grounded with the bow raised approximately 1.5 m.

All compartments were quickly inspected, and No. 1 port tank was found to be holed and losing some of the cargo of calcium chloride into the canal. The cargo from damaged tank No. 1 was transferred to No. 4 port tank and, some 10-15 minutes after the grounding, the spill was controlled.

An attempt was made to refloat the vessel, but to no avail. The tug "PATRICIA B. MCALLISTER" was sent for. She arrived on-scene at about 1515, and the refloating attempts commenced at approximately 1600.

According to the soundings around the vessel, the "J.C. PHILLIPS" was aground forward for 1/3 of her length, with the stern in deep water.

Between 1600 and 1730, manoeuvres were carried out to move the vessel astern, but the attempts were unsuccessful. As a result of this failure the cargo was transferred from forward to aft until a calculated draft of 7.77 m aft was reached. Meanwhile, the tug

carried the starboard anchor some 30 m astern of the vessel where it was let go.

Without ensuring that there was sufficient water and that there were no obstacles astern of the vessel, refloating manoeuvres were resumed at about 2000 under the master's orders. With the vessel's main engine at full astern, orders were given to heave on the starboard anchor and the tug to pull astern.

At approximately 2022, the "J.C. PHILLIPS" floated free and began to move rapidly astern. After going astern some 100 m, the stern struck an obstacle and the vessel once again came to a stop on a shoal, heading 087° (G).

The steering gear was heavily damaged on impact, and the tiller was bent approximately 110° to port. The "J.C. PHILLIPS", once again aground, was now without steering.

After transferring some cargo forward in order to reduce the aft draught, the "J.C. PHILLIPS" was refloated at about 2310 and was towed to the Valleyfield Wharf.

Analysis

1. Certificates

All the certificates of the vessel "J.C. PHILLIPS" at the time of the grounding were valid.

2. Equipment and main engine

All the equipment and the VHF radiotelephones were in working order and the course recorder was operating. The gyro error was negligible.

The main engine and other machinery were also in working order and did not contribute to the grounding.

3. Weather

At the time of the grounding, the wind was variable and the barometric pressure was steady at 1,009 mb. The temperature was -10° C, and visibility was near zero due to sea smoke.

4. Current and ice conditions

In the vicinity of the intersection of the range lights of St. Louis and the Valleyfield Bridge, the current runs to the northeast, at a rate considerably dependant upon the rate of flow from the Beauharnois control dam. According to a 1970 study of the currents undertaken by the Seaway Administration,

the current in this sector would be of a mean velocity of about 4.5m/sec.

At the time of the casualty, the Beauharnois Canal was ice-free, and the grounding of the "J.C. PHILLIPS" was not attributable to the current or to ice.

5. Water level

While the vessel was aground, the water level was 0.46 m above the chart datum and according to the graph on the CHS chart No. 1411 depicting mean water level, the water level was normal for the season.

6. Site of grounding

The grounding of the "J.C. PHILLIPS" in the Beauharnois Canal occurred to the south of Buoy C31, i.e. some five cables east of the intersection of the range lights of St. Louis and the Valleyfield Bridge.

Following the casualty, the summer buoys in the sector were checked and found to be in position, except for Buoy C31, which was observed to be some 4.5 m off position toward the centre of the channel.

7. Vessel speed

The average speed over the ground of the "J.C. PHILLIPS" was approximately 10.7 knots from the floats D1, D2 to the Valleyfield Bridge and approximately 10.5 knots from the bridge to the position of grounding.

8. Traffic in the canal

At the time of the grounding, there was only one other vessel in the Beauharnois Canal, the upbound vessel "RALPH MISENER".

The vessels had reported to Seaway Beauharnois that visibility in the canal was down to about 0.25 mile. The Seaway Handbook stipulates the following under "Fog":

> "...in the Beauharnois Canal ... two-way navigation will be permitted until visibility falls to 0.75 mile at which point navigation will be suspended."

At approximately 0637, Seaway Beauharnois attempted to direct the upbound vessel "RALPH MISENER" to the emergency anchorage above the St. Louis Bridge to wait until the downbound tanker "J.C. PHILLIPS" passed. However, the "RALPH MISENER" did not

stop, giving the reason that she had almost reached the western end of the anchorage.

Following this communication with the "RALPH MISENER", Seaway Beauharnois advised the tanker "J.C. PHILLIPS" to contact the upbound vessel "RALPH MISENER" in order to agree on their meeting procedures.

9. Details of grounding

At approximately 0638, Seaway Beauharnois contacted the "J.C. PHILLIPS" and advised her to call the upbound vessel "RALPH MISENER" and agree on their meeting procedures in the canal. This communication lasted approximately 30 seconds and, 13 seconds later, there was another radio call, "Is that you, Claude?", with the other vessel replying, "Yes, it's me." This conversation between the two vessels lasted about 40 seconds. During this time, the "J.C. PHILLIPS" had already initiated her turn to port, and the officer-in-charge of pilotage had moved away from the radar to answer the call.

In near-zero visibility condition in sea smoke, the "J.C. PHILLIPS" turned slowly to port in the vicinity of the intersection of the range lights of St. Louis and the Valleyfield Bridge with no one on the bridge monitoring the vessel's progress in the channel. During this call with the "RALPH MISENER", the officer-in-charge of pilotage was stationed at the radiotelephone on the port side of the bridge, the master was standing to the left of the control panel, the officer of the watch was standing on the right near the window in order to locate the buoys, and the helmsman had the rudder at port 10^{0}. When the communication between the "J.C. PHILLIPS" and the "RALPH MISENER" ended, the officer-in-charge of pilotage returned to the radar, at which point he realized that the vessel was to the south of the channel. He ordered the helmsman to 'turn more rapidly', but it was too late, the vessel was in the process of striking the bottom and, after several bumps, she came to a stop south of Buoy C31.

10. Look-out

Part B, Section 1 of the Collision Regulations apply to conduct of vessels in any condition of visibility and Rule 5 states, in part:

RULE 5

Look-out

> Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

As the radar was not effectively monitored, and as no buoy was sighted visually, all available means were therefore not used to ensure a radar and visual watch within the meaning of the above rule.

11. Radio communications

With respect to radio communications, radiotelephone call procedures stipulate that the calling and called stations must be identified.

The anonymous call on Channel 14 at about 0639, approximately one minute prior to the grounding, where one vessel said, "Is that you, Claude?", and the other replied, "Yes, it's me," did not comply with radiotelephone call procedures.

12. Navigation of vessel

With respect to the navigation of the vessel, her position was not checked carefully despite the presence of the master and two officers on the bridge.

As for the officer-in-charge of pilotage, he had the responsibility to navigate by radar and handle radio communications.

At the time of the grounding, the basic principles to be followed during the watch had not been observed with regard to checking the vessel's position. (See Part I of the Recommended Code of Nautical Procedures and Practices, attached.) Further, at a critical point during course alteration, the attention of the officer-in-charge of pilotage was diverted by radio communications.

13. Compulsory pilotage

The casualty of the "J.C. PHILLIPS" occurred in a compulsory pilotage zone. Under the terms of the Great Lakes Pilotage Regulations, it is recognized that a Canadian vessel is exempted from the requirement to have a duly licensed pilot,

provided the master or deck officers have made 10 one-way trips in the Great Lakes sector over the past 36 months.

In this case, the master and the two deck officers had been recognized as competent by the shipowners for this Great Lakes sector, which comes under the Great Lakes Pilotage Authority. In fact, an affidavit dated March 27, 1989, signed by the shipowners, recognized the competence of these officers.

14. Lost cargo

On departure from Amherstburg on November 20, 1989, the "J.C. PHILLIPS", a single-shell tanker, had 8,159 tonnes of calcium chloride in her tanks and, upon arrival in the Port of Montreal, on November 26, 1989, following her grounding 7,873 tonnes of cargo remained, representing a shortfall of some 286 tonnes. However, it was estimated that some 13 tonnes of calcium chloride had spilled into the canal following the holing of No. 1 port tank. The balance of the loss was due to contamination of water in the tanks.

15. Material safety data sheet

Liquid calcium chloride is used primarily as a de-icing agent, as a lubricant for drills, freeze-proofing treatment for ore, thawing agent and concrete curing agent. Its density is 1.3557.

Certain precautions must be taken to avoid inhalation, ingestion and any contact with the skin or eyes. It is considered moderately toxic.

In environmental terms, a chloride spill can be harmful to aquatic life in concentrations higher than 500 ppm.

In this case, the current in the Beauharnois Canal may have rapidly diluted the calcium chloride concentration when the spill occurred.

16. Qualifications and experience of crew

The master holds a Certificate of Competency as First Mate Foreign-Going and Master Home-Trade, since 1985. He has been sailing since 1973 and obtained his first certificate as Watchkeeping Mate in 1979. He has been sailing on tankers for nine years. He sailed as first mate from 1983 to 1987, and subsequently has alternated between first mate and master. He was master of the "J.C. PHILLIPS" at the time of the grounding and had been recognized by an affidavit from his shipowners as competent to pilot a vessel in the sector where the casualty occurred.

The officer-in-charge of pilotage at the time of the casualty is the holder of a Certificate of Competency as First Mate Home-Trade and Second Mate Foreign-Going issued in March 1989. He has been sailing since 1974, except for a period from 1984 to 1985 when he did not sail. He has been employed by the present company since 1986. He obtained a first certificate as Watchkeeping Mate in 1980 and a CNII Certificate in 1983. For the 1989 navigation season, he was recognized by an affidavit from his shipowners as being competent to pilot a vessel in the sector where the casualty occurred.

The officer of the watch has been sailing for 20 years and has been the holder of a Certificate of Competency as Second Mate Foreign-Going and First Mate Home-Trade, since 1982. He obtained a first certificate as Watchkeeping Mate in 1978. He has been on board the "J.C. PHILLIPS" ex "GULF GATINEAU" as first mate for nine years. His knowledge of this sector was limited although his name appears on the shipowners' affidavit as being competent to pilot a vessel in the sector where the casualty occurred.

The helmsman on duty at the time of the grounding has been sailing since 1979, and has been on board the vessel for the last 10 years. He has sailed as deck-hand, helmsman and boatswain since 1979.

Findings

On November 24, 1989, the Canadian tanker "J.C. PHILLIPS" downbound in the Beauharnois Canal, ran aground, during a period of reduced visibility in sea smoke.

It would appear that the following factors contributed to the grounding:

- an appropriate radar and visual watch was not maintained;
- at a critical point during course alteration, the attention of the officer-in-charge of pilotage was diverted by radio communications;
- the change of course was initiated without anyone effectively using the radar to assess and monitor the vessel's progress in the channel.

Other Findings

The measures taken to refloat the vessel without first ensuring that there were no obstacles astern of the vessel caused major damage to the steering gear.

Liquid calcium chloride can be harmful to aquatic life in concentrations higher than 500 ppm.

According to the Seaway Handbook, navigation must be suspended when visibility drops to 0.75 mile in the Beauharnois Canal. Visibility at the time of the casualty was down to 0.25 mile.

The officer of the watch affirmed that he was not very familiar with the sector.

Proper radiotelephone operational procedures were not used by either the "J.C. PHILLIPS" or the "RALPH MISENER".

Transportation Safety Board of Canada
Investigations - Marine
P.O. Box 9120
Alta Vista Terminal
OTTAWA, ONTARIO
K1G 3T8

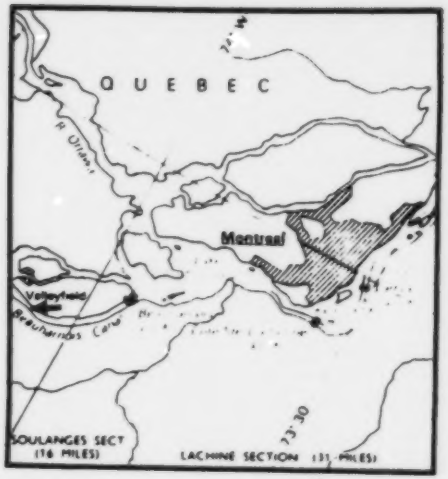
MARCH 1991.

1. THE INFORMATION ON THIS CHART HAS BEEN COMPILED BY THE MARINE CASUALTY INVESTIGATIONS BRANCH

2. ALL TRACKS AND POSITIONS ARE APPROXIMATE

1. LA DIRECTION DES ENQUÊTES SUR LES ACCIDENTS MARITIMES A COMPILÉ LES RENSEIGNEMENTS SUR CETTE CARTE

2. TOUS LES SILLAGES ET POSITIONS SONT APPROXIMATIFS



"J.C. PHILLIPS"

SECTION OF CHS CHART No. 1411

SECTION DE LA CARTE N° 1411 DU SHC

DEPTHS IN FEET

PROFONDEURS EN PIEDS

FG93h

45°14'N

74°06'W

74°04'W

GROUNDING POSITION

POSITION DE L'ÉCHOUEMENT

Port de Valleyfield

Voir cartouche

See Inset

W10

W9

Forest Ditch

271°

270°

BRASSES / FATHOMS

PIEDS / FEET

MÈTRES / METRES

ANNEX

RECOMMENDED CODE OF NAUTICAL PROCEDURES AND PRACTICES TO BE FOLLOWED BY PERSONS ON BOARD SHIPS IN ORDER TO ENSURE SAFETY AND POLLUTION PREVENTION.

PART I

BASIC PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH

1. Parties shall direct the attention of shipowners, ship operators, masters and watchkeeping personnel to the following principles which shall be observed to ensure that a safe navigational watch is maintained at all times.
2. The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational watch. Under the master's general direction, the officers of the watch are responsible for navigating the ship safety during their periods of duty when they will be particularly concerned with avoiding collision and stranding.
3. The basic principles, including but not limited to the following, shall be taken into account on all ships.

4. **Watch arrangements**

   (a) The composition of the watch shall at all times be adequate and appropriate to the prevailing circumstances and conditions and shall take into account the for maintaining a proper look-out.

   (b) When deciding the composition of the watch on the bridge which may include appropriate deck ratings, the following factors, inter alia, shall be taken into account:

   (i) at no time shall the bridge be left unattended;

   (ii) weather conditions, visibility and whether there is daylight or darkness;

   (iii) proximity of navigational hazards which may make it necessary for the officer in charge of the watch to carry out additional navigational duties;

   (iv) use and operational condition of navigational aids such as radar or electronic position-indicating devices and any other equipment affecting the safe navigation of the ship;

   (v) whether the ship is fitted with automatic steering;

   (vi) any unusual demands on the navigational watch that may arise as a result of special operational circumstances.

5. **Fitness for duty**

   The watch system shall be such that the efficiency of watchkeeping officers and watchkeeping ratings is not impaired by fatigue. Duties shall be so organized that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and other-wise fit for duty.

6. **Navigation**

   (a) The intended voyage shall be planned in advance taking into consideration all pertinent information and any course laid down shall be checked before the voyage commences.

   (b) During the watch the course steered, position and speed shall be checked at sufficiently frequent intervals, using any available navigational aids necessary, to ensure that the ship follows the planned course.

   (c) The officer of the watch shall have full knowledge of the location and operation of all safety and navigational equipment on board the ship and shall be aware and take account of the operating limitations of such equipment.

   (d) The officer in charge of a navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship.

7. **Navigational equipment**

   (a) The officer of the watch shall make the most effective use of all navigational equipment at his disposal.

   (b) When using radar, the officer of the watch shall bear in mind the necessity to comply at all times with the provisions on the use of radar contained in the applicable regulations for preventing collisions at sea.

   (c) In cases of need the officer of the watch shall not hesitate to use the helm, engines and sound signalling apparatus.

8. **Navigational duties and responsibilities**

   (a) The officer in charge of the watch shall:

(i) keep his watch on the bridge which he shall in no circumstances leave until properly relieved;

(ii) continue to be responsible for the safe navigation of the ship, despite the presence of the master informs him specifically that he has assumed that responsibility and this is mutually understood;

(iii) notify the master when in any doubt as to what action to take in the interest of safety;

(iv) not hand over the watch to the relieving officer if he has reason to believe that the latter is obviously not capable of carrying out his duties effectively, in which case he shall notify the master accordingly.

(b) On taking over the watch the relieving officer shall satisfy himself as to the ship's estimated or true position and confirm its intended track, course and speed and shall note any dangers to navigation expected to be encountered during his watch.

(c) A proper record shall be kept of the movements and activities during the watch relating to the navigation of the ship.

9. Look-out

In addition to maintaining a proper look-out for the purpose of fully appraising the situation and the risk of collision, stranding and other dangers to navigation, the duties of the look-out shall include the detection of ships or aircraft in distress, shipwrecked persons, wrecks and debris. In maintaining a look-out the following shall be observed:

(a) the look-out must be able to give full attention to the keeping of a proper look-out and no other duties shall be undertaken or assigned which could interfere with that task;

(b) the duties of the look-out and helmsman are separate and the helmsman shall not be considered to be the look-out while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper look-out. The officer in charge of the watch may be the sole look-out in daylight provided that on each such occasion:

(i) the situation has been carefully assessed and it has been established without doubt that it is safe to do so;

(ii) full account has been taken of all relevant factors including, but not limited to:
- state of weather
- visibility
- traffic density
- proximity of danger to navigation the attention necessary when navigating in or near traffic separation schemes;

(ii) assistance is immediately available to be summoned to the bridge when any change in the situation so requires.

10. Navigation with pilot embarked

Despite the duties and obligations of a pilot, his presence on board does not relieve the master or officer in charge of the watch from their duties and obligations for the safety of the ship. the master and the pilot shall exchange information regarding navigation procedures, local conditions and the ship's characteristics. The master and officer of the watch shall co-operate closely with the pilot and maintain an accurate check of the ship's position and movement.

11. Protection of the marine environment

The master and officer in charge of the watch shall be aware of the serious effects of operational or accidental pollution of the marine environment and shall take all possible precautions to prevent such pollution, particularly within the framework of relevant international and port regulations.

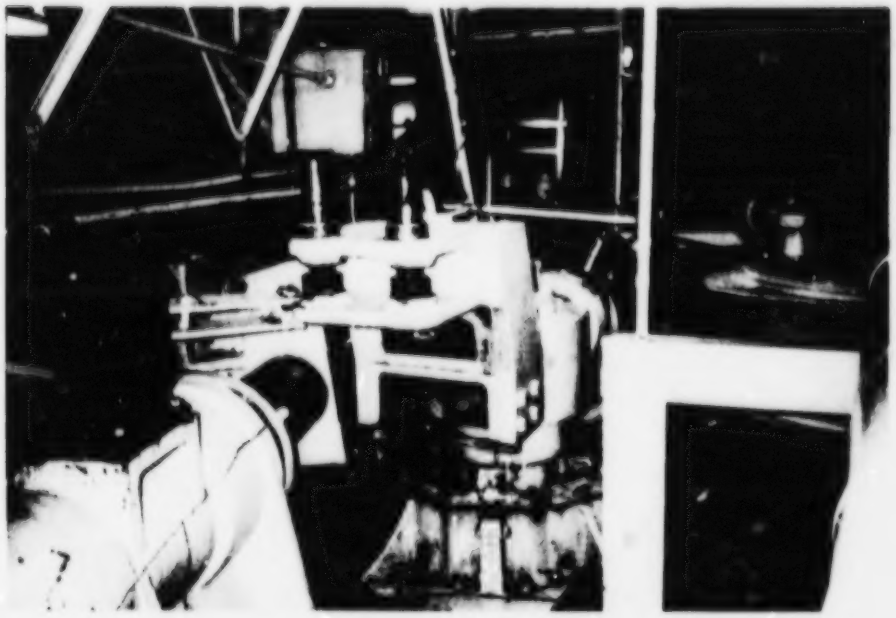
"J.C. PHILLIPS" échoué dans le canal de Beauharnois au Sud de la bouée C31, le 25 novembre, 1989

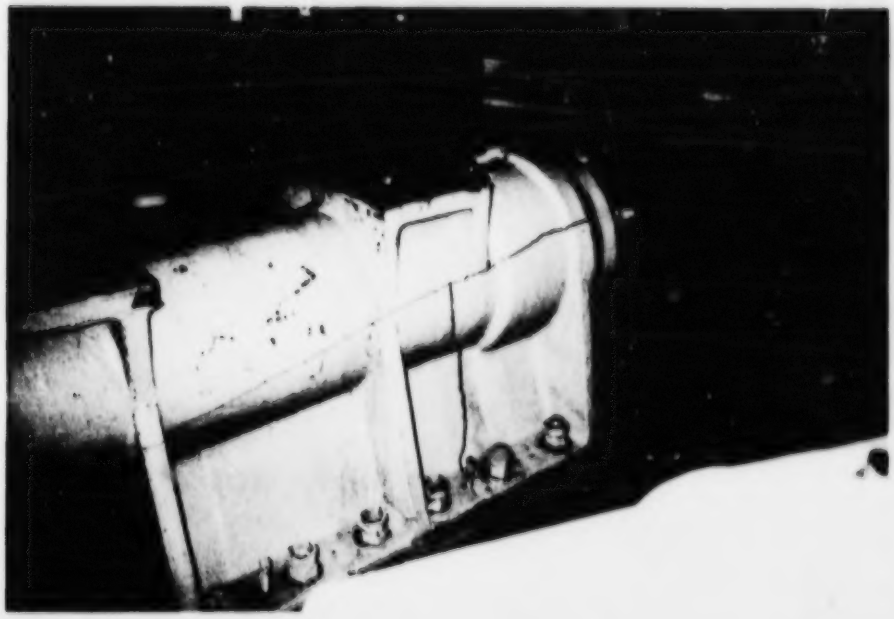
"J.C. PHILLIPS" aground in Beauharnois Canal south of buoy C31, November 25, 1989.

"J.C. PHILLIPS" échoué dans le canal de Beauharnois au Sud de la bouée C31, le 25 novembre, 1989

"J.C. PHILLIPS" aground in Beauharnois Canal south of buoy C31, November 25, 1989.

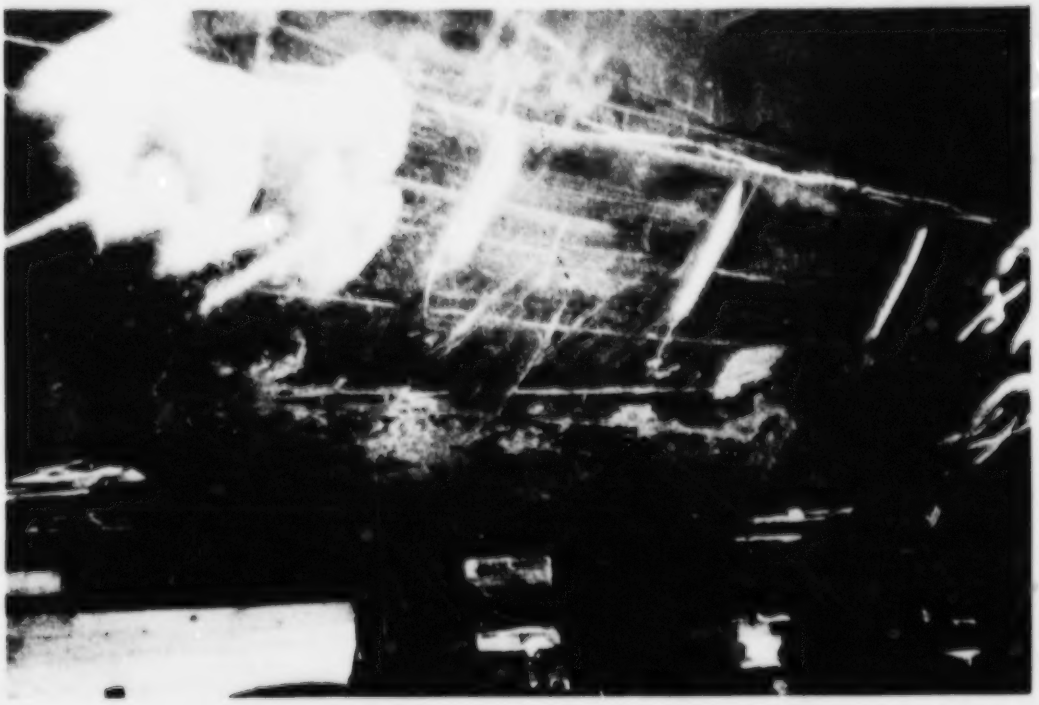
Avaries à l'appareil à gouverner
cylindre fracturé

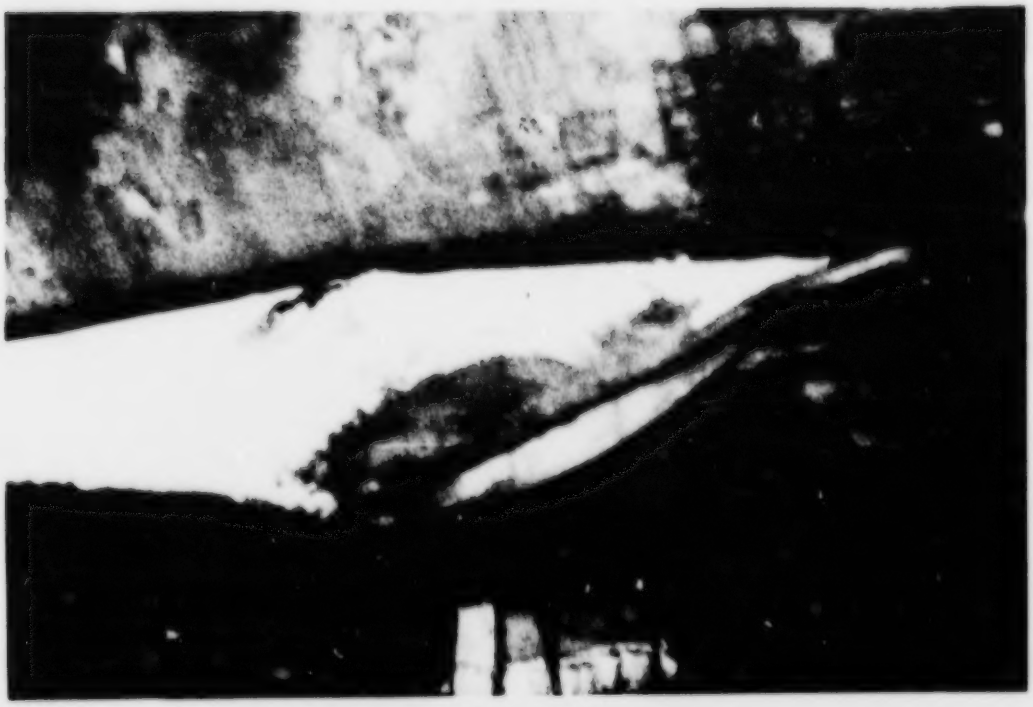




Damage to the steering gear - fractured cylinder.

Avaries au fond de carène du navire "J.C. PHILLIPS"
- Photo courtoisie des armateurs





"J.C. PHILLIPS" - Damage to bottom
plating - Photo courtesy of the owners

Avaries au fond de carène du navire "J.C. PHILLIPS"
- Photo courtoisie des armateurs

"J.C. PHILLIPS" - Damage to bottom plating - Photo courtesy of the owners